[[Body]]

```
; body mass (in kg)
mass = F, def 800

; inertia matrix
Jx = F, def 300
Jy = F, def 1000
Jz = F, def 900
Jyz = F

; fuel quantity (adjustable : def min max pas)
fuel_quantity = F

; graphic height
hauteur_graphique= F,def 0.1
SCx_carro= F, def 0.3
SCz_carro= F, def 0.3

; aspiration Maxfall et Distance
maxfall=L, def 75
distance=L, def 100
```

[[/Body]]

[[Geometry]]

```
CG_height = F, def 0.3

; Position des centres de roulis dans le repère de la voiture.
front_roll_center = F3, def 0
rear_roll_center = F3, def 0

body_graphic_height = F, def 0.0

front_wheel_X = F
front_half_track = F
rear_wheel_X = F
rear_half_track = F

5th_wheel_x = F
5th_wheel_y = F
5th_wheel_z = F

; claw curve : depends on wheel local height, substracted from right
wheel angle, added to left wheel
front_claw_curve = X, def common/void.crv
rear_claw_curve = X, def common/void.crv
; static claw for each wheel in usual order (front right, rear right,
front left, rear left (added to each wheel angle)
wheels_static_claw = F4, def 0

; position du centre de gravité par rapport a empattement et voie
L1=F, def 1.3
L2=F, def -1.5
V1=F, def 0.84
```

```
      v2=F, def 0.81


      ; Delimitation of the bounding box in the referential of the car
centered on G
      min_bb_point= F3, def -1.0
      max_bb_point= F3, def 1.0
```

[[/Geometry]]

[[Suspension]]

```
front_ride_height = F
rear_ride_height = F
; raideur barres anti roulis (réglable)
front_antiroll_rate = F
rear_antiroll_rate = F
; raideur ressort (réglable)
front_spring_rate = F
rear_spring_rate = F

front_min_travel = F
rear_min_travel = F
front_max_travel = F
rear_max_travel = F
front_bump_length = F
rear_bump_length = F
;front_camber_rate = F
;rear_camber_rate = F
front_camber_curve = X, def common/cam_fron.crv
rear_camber_curve = X, def common/cam_rear.crv
front_camber_thrust_curve = X, def common/camthr_f.crv
rear_camber_thrust_curve = X, def common/camthr_r.crv
front_camber_static_calculation = F
rear_camber_static_calculation = F
front_damper_low_rate = F
rear_damper_low_rate = F
front_damper_high_rate = F
rear_damper_high_rate = F
front_damper_low_rebound_rate = F
rear_damper_low_rebound_rate = F
front_damper_high_rebound_rate = F
rear_damper_high_rebound_rate = F
front_damper_min_velocity = F
rear_damper_min_velocity = F
front_damper_max_velocity = F
rear_damper_max_velocity = F
front_damper_bump_velocity = F
rear_damper_bump_velocity = F
front_damper_rebound_velocity = F
rear_damper_rebound_velocity = F
front_bump_total_spring_rate = F
rear_bump_total_spring_rate = F
```

[[/Suspension]]

[[Gearbox]]

```
nb_gears = L, min 1, max 7, def 6
```

```
        1st_gear = F
        2nd_gear = F
        3rd_gear = F
        4th_gear = F
        5th_gear = F
        6th_gear = F
        backward_gear = F
        diff_gear = F

        max_threshold = F
        min_threshold = F
        clutch_threshold = F
        declutch_threshold = F

        ratio_of_max_speed = F, min 0, max 1, def 0.5
        [[/Gearbox]]

        [[Engine]]
        engine_braking = F
        commanded_speed_decrease_speed = F
        commanded_speed_increase_speed = F
        full_throttle_curve = X

        max_speed = F
        idle_speed = F

        ; fuel consumption
        fuel_consum = F
        brake_torque=F, def 0.05
;       torque_curve= X, def Moteur_306.crv
        ;turbo_torque= X, def turbo.crv
        ;turbo_pressure= F, min0, def 1 0 4 0.1
        ; rotative parts inertia
        inertia= F, def 0.5
        ; When the car is below min_speed, the engine acts as if at neutral when
in 1st gear
        min_speed= F, def 5.0

        ; ************** NEW ENGINE PARAMETERS *************
        braking_curve= X, def eng_brak.crv
        startup_torque= F, min 0, def 1000  ; N.m
        startup_min_speed= F, min 0, def 2200  ; revs
        clutch= X, def clutch.crv
        startup_clutch_revs= F, def 4000
        [[/Engine]]

        [[Brakes]]
        braking_balance = F              ; % for front, 1-% for rear
        reduction_ratio = X, def common/brredrat.crv
        max_braking_force = F
        max_handbrake_time = F, def 0.0

        max_handbrake_force = F, def 4000
        ;******Santi: new 15/02/2000
        braking_aid_force = F, def 1000
```

```
        handbraking_aid_force = F, def 500
        braking_aid_speed = F, def 25     ;m/s
        braking_balance_curve = X, def common/brk_bal.crv
```

[[/Brakes]]

[[Tyre]]

```
        default_type = L, def 0, min 0, max 4

        ; Tyres array represent only master surfaces (12 master surfaces), which
are:
        ; Tarmac, HalfWetTarmac, WetTarmac, HalfSnowyTarmac, SnowyTarmac,
        ; DirtyTarmac, Grass, WetGrass, Soil, WetSoil, WaterPuddle and IcePuddle

        wear_coeff_B0_to_B4_N = F6
        water_resistance_coeff_A0_to_A2 = F3
        camber_temperature_coeff = F
        inner_temperature = F
        medium_temperature = F
        external_temperature = F

        ;V1_tyre_friction_coeff_front = F17, def 0  -->SANTI
        ;V2_tyre_friction_coeff_front = F17, def 0
        ;V1_tyre_friction_coeff_rear = F17, def 0  --> SANTI, removed 12-09-00
        ;V2_tyre_friction_coeff_rear = F17, def 0


        rear_high_angle_lateral_curve = X4
        rear_low_angle_lateral_curve = X4
        front_high_angle_lateral_curve = X4
        front_low_angle_lateral_curve = X4

        ; Reduction of X force on the tyre according to the slip angle
        reduc_X_from_slip_angle_curve = X4

        ; Reduction of forces on the tyre according to the sliding
        lateral_ratio_slid_curve_rear = X4
        lateral_ratio_slid_curve_front = X4
        longitudinal_ratio_slid_curve = X4

        Fx_on_Fy = F, def 1.0

        minimum_sliding = F, def 1.0, min 0, max 1

        front_show_marks_slip = F, def 20.0
        rear_show_marks_slip = F, def 10.0
        show_smoke_slip = F, def 22.0
        show_marks_slid = F, def 0.9, min 0, max 1
```

[[/Tyre]]

[[Wheels]]
```
; wheels radiuses
front_wheel_radius = F, def 0.345
rear_wheel_radius = F, def 0.345
5th_wheel_radius = F

; wheels masses
front_wheel_mass = F
rear_wheel_mass = F
5th_wheel_mass = F

inertia_moment_y = F, def 7
static_roll_friction = L, def 7      ;Given in N.m
variable_roll_friction = F, def 5    ;(N.m.s²/rad²)
```
[[/Wheels]]

[[Transmission]]
```
; Transmission type : QUATRE_QUATRE = 1, TRACTION_AVANT = 2,
PROPULSION_ARRIERE = 3
type = L, def 3, min 1, max 3

Front_diff = B, def TRUE
Rear_diff = B, def FALSE
Central_diff= B, def FALSE
;    overall_output =???
front_axle_ratio= F, def 6                          ; it's gear ratio in
front differential box
rear_axle_ratio= F, def 6                           ; it's gear ratio in
rear differential box
central_axle_ratio = F, def 6                        ; it's gear ratio in
central differential box
```
[[/Transmission]]

[[Commands]]
[[[Keyboard]]]
```
braking_rate = F
accelerating_rate = F
steering_speed = F
steering_return_speed = F
max_braking_time = F

; ************** NEW ENGINE PARAMETERS *************
load_up_rate = F,def 1.0, min 0.0
load_down_rate = F,def 4.0, min 0.0
```
[[[/Keyboard]]]

[[[Steering]]]
```
max_steering = F
limiter = X, def Limiter.crv
function = X, def SteerFun.crv
```

```
            [[[/Steering]]]

        [[Input_Command]]
;       Acceleration_sensibility= X,def accel_curve.crv
;       brake_sensibility = X, def brake_curve.crv
        brake_delay = F, def 0.5                          ; delay before applying
force , second unit
        [[/Input_Command]]
        [[/Commands]]

        [[Aerodynamism]]
        front_wing_x = F, def 1.7
        front_wing_surface = F, def 0.4
        rear_wing_x = F, def -1.4
        rear_wing_surface = F , def 0.6
        body_surface = F

        ; formerly at the end of the .voi
        front_wing_Cx = F
        front_wing_Cz = F
        rear_wing_Cx = F
        rear_wing_Cz = F
        body_Cx = F
        body_Cz = F


;       front_wing_Cx_curve = X
;       rear_wing_Cx_curve = X
;       body_Cx_curve = X
;       front_wing_Cz_curve = X
;       rear_wing_Cz_curve = X
;       body_Cz_curve = X
;       front_x_incidence = F
;       rear_x_incidence = F

        y_front_wing= F,def 0                             ; front wing coordinates
        z_front_wing= F,def 0
        y_rear_wing= F,def 0                              ; rear wing coordinates
        z_rear_wing= F,def 0

        Angle_front_wing= F4
        Angle_rear_wing= F4
        [[/Aerodynamism]]

        [Differential]


            MiddleDiffStaticBalance = F,def 0.5, min 0.0, max 1.0

            MiddleDiffDinamicBalanceCurve= X, def common/void.crv

            [[Axle]]
            ; Type of differential
```

```
                ; 0 -> Dummy differential (no differential - same torque on each
motorized wheel)
                ; 1 -> Open differential
                ; 2 -> Auto blocking differential
                ; 3 -> Limited sliding differential
                ; 4 -> Torsen differential
                ; 5 -> Viscous coupler differential
                ; Note: specifying a differential type on a non motorized axle has
no effect.
                Type = L, def 3, min 0, max 5


                ; Minimum rotation speed of the wheel to avoid zero division
                MinRotationSpeed = F, def 0.01, min 0.0001, max 0.1
                ; Difference of rotation speed between the two wheels from where
the differential is blocking
                DeltaOmegaMax = F, def 30.0, min 0.0  ; rpm
                ; Decides if we use blocking ratio for the limited sliding
differential or the other parameters            (alpha,Re,Ri,d)
                UseBlockingRatio = B, def False
                ; Value of the blocking ratio
                BlockingRatio = F, def 0.5, min 0.0, max 1.0

                ; Value of the blocking ratio
                Number_Of_Plates = L, def 4, min 1
                ; Value of the friction coefficient of the plates
                Friction_Coef = F, def 0.1
                ; Ratio used for the limited sliding diff (transfer ratio)
                Sliding_Ratio = F, def 0.35, min 0.0, max 1.0
                ; Value of tangent alpha (default is for alpha=40°)
                Tangent_Alpha_Accel = F, def 1, min 0.0
                Tangent_Alpha_Decel = F, def 1, min 0.0
                ; Distance d
                d = F, def 0.04, min 0.0
                ; Inner radius of the plates
                Inner_Radius = F, def 0.033, min 0.0
                ; Inner radius of the plates
                Outer_Radius = F, def 0.062, min 0.0
                ; Threshold used with the limited sliding differential to
                ; decide if the two wheels of an axle are 'almost' rotating at
                ; the same speed or not (rpm)
                Diff_Rotating_Speed_Thres = F, def 45, min 0.0

                torsen_diff_sliding = F, def 0.3, min 0.0, max 1.0

                ; Viscous coupler differential ; defined by 2 straight lines
                Visc_a1 = F4, def 0.106, min 0
                Visc_a2 = F4, def 0.0477, min 0
                Visc_b2 = F4, def 0.1
                Visc_Def_Pos = L, def 3, min 0, max 4
                [[/Axle]]

        [/Differential]
```

[Collisions]

[[Body]]
```
max_spring_force = L, min 0, def 8000
max_contact_force = L, min 0, def 9000

max_contact_depth = F, min 0, def 0.3
damp_rate = F, min 0, def 1500
mean_contacts_nb = L, min 0, def 4

solid_friction_coeff = F, min 0, def 0.5
speed_increase = F, min 0, def 1.0

    [Contact_sphere]
    radius = F, min 0, def 0.2
    center_location = F3
    [/Contact_sphere]
```

[[/Body]]

[/Collisions]

```
[GroupeN]

    [[Suspension]]
        [[[custom_grN_sus1]]]                   ; ressort amortisseur reglable
        ;custom GrN_sus1  raideur ressort competition reglable
        spring_rate_front= L4
        spring_rate_rear= L4
        ;custom GrN_sus1 raideur butées basse competition reglable
        bump_stop_front= L4
        bump_stop_rear= L4
        ; custom GrN_sus1 longueur des butées reglable
        bump_stop_front= L4
        bump_stop_rear= L4
        ; custom GrN_sus1 suspension travel reglable
        bump_front_right_travel= F4
        bump_front_left_travel= F4
        bump_rear_right_travel= F4
        bump_rear_left_travel= F4
        rebound_front_right_travel= F4
        rebound_front_left_travel= F4
        rebound_rear_right_travel= F4
        rebound_rear_letf_travel= F4
        ; custom GrN_sus1 competition damper curve
;       damper_front_right=X, def compet.crv
;       damper_front_left=X, def compet.crv
;       damper_rear_right=X, def compet.crv
;       damper_rear_left=X, def compet.crv
        [[[/custom_grN_sus1]]]
```

```
                [[[custom_Grn_sus2]]]                    ; barre antiroulis reglable
                ;custom GrN_sus2 raideur barres anti roulis reglable
                roll_rate_front= L4
                roll_rate_rear= L4
                [[[/custom_Grn_sus2]]]

                [[[custom_GrN_sus3]]]                    ; kit carrossage reglable
                ;Camber curve camber and toe_in toe_out
;               camber_travel_front= X, def kit_camber_front.crv
;               camber_travel_rear=X, def kit_camber_rear.crv
                camber_static_front= F4
                camber_static_rear= F4

                toe_static_rear= F4
                toe_static_front= F4
                [[[/custom_GrN_sus3]]]
        [[/Suspension]]

        [[Engine]]

                [[[engine_custom]]]
                ; customN1:air filter, exhaut, plug
;               N1_torque_added= X,def GrN_engine_ev1.crv
                GrN_ev1_reliability= F, def -5
                ; customN2: ignition electronic box
;               N2_torque_added= X, def GrN_engine_ev2.crv
                GrN_ev2_reliability= F, def -5
                ; customN3: power boost valve
;               N3_torque_added = X, def GrN_engine_ev3.crv
                GrN_ev3_reliability= F, def -5
                ; customN4: fueling
                GrN_ev4_reliability= F, def +5
                [[[/engine_custom]]]


        ;engine brake
        brake_torque=F, def 0.05
;       torque_curve= X, def engine.crv
        ;turbo_torque= X, def turbo.crv
        ;turbo_pressure= F, min0, def 1 0 4 0.1
        ; rotative parts inertia
        engine_inertia= F, def 50
        consumption_engine= F, def 0.4                          ; no unit
        [[/Engine]]

        [[Transmission]]

        RWD = B , def FALSE
        FWD = B, def TRUE
        4WD = B, def FALSE
        Front_diff = B, def TRUE
        Rear_diff = B, def FALSE
        Central_diff= B, def FALSE
;       overall_output =???
        front_axle_ratio= F, def 6                    ; it's gear ratio in
front differential box
        rear_axle_ratio= F, def 6                     ; it's gear ratio in
```

```
rear differential box
      central_axle_ratio = F, def 6                        ; it's gear ratio in
central differential box
      [[/Transmission]]

      [[gear_box]]

            [[[custom_gear_box]]]
            ; custom N : preparation fiabilité embrayage et boite
            GrN_gb1_reliability = F, def +5
            [[[/custom_gear_box]]]

      ; gear ratio
      First_gear= F4
      Second_gear = F4
      Third_gear = F4
      Fourth_gear = F4
      Fifth_gear = F4
      Sixth_gear = F4
      backward_gear = F4

      rev_gear_up =L , def 300                        ; rev_gear_up is RPM
number before max engine rev
      clutch_rev= L, def 2500
      ; clutch ???
      [[/gear_box]]

      [[Brake]]

            [[[custom_brake]]]
            ;
            [[[/custom_brake]]]

      Force_brake = L4          ; braking force applied on the car
      Balance_brake= F4         ;, min0, max 1, def 0.55 0 1 0.05
            ; % for front, 1-% for rear
      handbrake_force = F, def 3000                   ; for rear axle only
      [[/Brake]]

[/GroupeN]

[GroupeA:Origine]

      [[Suspension]]

            [[[custom_grA_sus1]]]                    ; ressort amortisseur reglable
idem GrN
            ;custom GrN_sus1  raideur ressort competition reglable
            spring_rate_front= L4
            spring_rate_rear= L4
            ;custom GrN_sus1 raideur butées basse competition reglable
            bump_stop_front= L4
            bump_stop_rear= L4
            ; custom GrN_sus1 longueur des butées reglable
            bump_stop_front= L4
            bump_stop_rear= L4
            ; custom GrN_sus1 suspension travel reglable
```

```
                bump_front_right_travel= F4
                bump_front_left_travel= F4
                bump_rear_right_travel= F4
                bump_rear_left_travel= F4
                rebound_front_right_travel= F4
                rebound_front_left_travel= F4
                rebound_rear_right_travel= F4
                rebound_rear_letf_travel= F4
                ; custom GrN_sus1 competition damper curve
;               damper_front_right=X, def compet.crv
;               damper_front_left=X, def compet.crv
;               damper_rear_right=X, def compet.crv
;               damper_rear_left=X, def compet.crv
                [[[/custom_grA_sus1]]]

                [[[custom_GrA_sus2]]]              ; barre antiroulis reglable in
board
                ;custom GrN_sus2 raideur barres anti roulis reglable
                roll_rate_front= L4
                roll_rate_rear= L4
                [[[/custom_GrA_sus2]]]

                [[[custom_GrA_sus3]]]              ; kit carrossage reglable
                ;Camber curve camber and toe_in toe_out
;               camber_travel_front= X, def kit_camber_front.crv
;               camber_travel_rear=X, def kit_camber_rear.crv
                camber_static_front= F4
                camber_static_rear= F4
                ; kit pincement reglable avant arriere
                toe_static_rear= F4
                toe_static_front= F4
                [[[/custom_GrA_sus3]]]

        [[/Suspension]]

        [[Engine]]

                [[[Engine_custom]]]
                ; custom A1: air box, exhaust, plug, turbo pressure, atomiser
;               A1_torque_added = X, def GrA_engine_ev1.crv
                GrA_ev1_reliability= F, def -5
                ; custom A2: mecanical engine parts, "preparation culasse"
;               A2_torque_added= X, def GrA_engine_ev2.crv
                GrA_ev2_reliability= F, def -5
                ; custom A3: mecanical engine parts,"preparation piston, cylindre"
;               A3_torque_added= X, def GrA_engine_ev3.crv
                GrA_ev3_reliability= F, def -5
                ; custom A4: ignition electronic box and limit rev in board
;               A4_torque_added= X, def GrA_engine_ev4.crv
                GrA_ev4_reliability= F, def -5
                ; custom A5: turbo pressure in board set
;               A5_torque_added= X, def GrA_engine_ev5.crv
                GrA_ev5_reliability= F, def -5

                ; custom A6: fueling, "reservoir, pompe a essence, durites"
                GrA_ev6_reliability= F, def +5
                ; custom A7: cooling, "radiateur eau, huile, durites"
```

```
                    GrA_ev7_reliability= F, def +5
                    [[[/Engine_custom]]]

        ;engine brake
        brake_torque=F, def 0.05
;       torque_curve= X, def engine.crv
        ;turbo_torque= X, def turbo.crv
        ;turbo_pressure= F, min0, def 1 0 4 0.1
        ; rotative parts inertia
        engine_inertia= F, def 50
        consumption_engine= F, def 0.4
        [[/Engine]]

        [[Transmission]]

                [[[transmission_custom]]]

                ; custom A1: "ponts differents"


                ; custom A2: "differentiels"
                ;diff_ouvert = B, def true
                ;diff_ferme = B, def false
                ;diff_autobloquant = B, def false
                ;diff_electronic_control= B, def false
                ;distribute_torque_diff_ouvert = X, def diff_open.crv
                ;distribute_torque_diff_ferme = X, def diff_closed.crv
                ;distribute_torque_diff_autobloquant = X, def diff_autoblock.crv
                ;distribute_torque_diff_glissement_limite = X, def diff_limit.crv
                ;slide_value = L4,min0,max100 def 50 0 100 1
                ;distribute_torque_diff_electronic = X, def diff_elec.crv
                [[[/transmission_custom]]]

        RWD = B , def FALSE
        FWD = B, def TRUE
        4WD = B, def FALSE
        Front_diff = B, def TRUE
        Rear_diff = B, def FALSE
        Central_diff= B, def FALSE
;       overall_output =???
        front_axle_ratio= F, def 6                      ; it's gear ratio in
front differential box
        rear_axle_ratio= F, def 6                       ; it's gear ratio in
rear differential box
        central_axle_ratio = F, def 6                   ; it's gear ratio in
central differential box

        [[/Transmission]]


        [[gear_box]]

                [[[custom_gear_box]]]
                ; custom A3 : preparation fiabilité embrayage et boite
                GrA_gb1_reliability = F, def +5
                [[[/custom_gear_box]]]
```

```
      ; gear ratio
      First_gear= F4
      Second_gear = F4
      Third_gear = F4
      Fourth_gear = F4
      Fifth_gear = F4
      Sixth_gear = F4
      backward_gear = F4

      rev_gear_up =L , def 300                          ; rev_gear_up is RPM
number before max engine rev
      clutch_rev= L, def 2500
      ; clutch ???

      [[/gear_box]]

      [[Brake]]

            [[[custom_brake]]]
            ;
            [[[/custom_brake]]]


      Force_brake = L4                ; braking force applied on the car
      Balance_brake= F4                   ; % for front, 1-% for rear
      handbrake_force = F, def 3000                 ; for rear axle only

      [[/Brake]]

[/GroupeA]
```